

Autologous iPSC Therapy for Urinary Incontinence

Grant Award Details

Autologous iPSC Therapy for Urinary Incontinence

Grant Type: Early Translational III

Grant Number: TR3-05569

Project Objective: The objective of this project is to identify a development candidate for the treatment of female urinary incontinence using iPSC-derived smooth muscle precursor cells (SMPC) and smooth muscle cells (SMC).

Investigator:

Name:	Bertha Chen
Institution:	Stanford University
Type:	PI

Disease Focus: Incontinence

Human Stem Cell Use: iPS Cell

Award Value: \$4,715,738

Status: Closed

Progress Reports

Reporting Period: Year 1

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Reporting Period: Year 2

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Reporting Period: Year 3

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Reporting Period: Year 4 (NCE)

Grant Application Details

Application Title: Autologous iPSC Therapy for Urinary Incontinence

Public Abstract: Urinary incontinence (UI) is common and serious, with two-thirds of the burden borne by women. UI impacts both quality and length of life; women with UI suffer debilitating falls, experience social isolation and are clinically-depressed more commonly than continent women. UI is the primary reason for elderly women to be institutionalized and carries an annual healthcare cost that exceeds \$20 billion in the USA. Up to 7 million Californian women are affected with UI, a number forecast to increase by 55% in 2010 to 2050. Surgery is the main treatment today but results can be variable with a need for repeat surgeries in 30-50% of women. Here, we describe our intended target product for UI based on FDA-compatible stem cells and a minimally-invasive route of delivery that is very familiar to physicians and is currently used for injection of bulking materials to treat UI. Our stem cell approach has the potential to provide an unlimited source of cells for tissue engineering and regenerative medicine. Thus, as an added benefit associated with this research, we establish a foundation for broad applications in women's health including disorders that affect the same type of cells as in UI, smooth muscle, such as diseases of the blood vessels, respiratory tract (e.g., chronic obstructive pulmonary disease-COPD and asthma), digestive system (e.g. gastroesophageal reflux disorder-GERD and motility disorders) and others secondary to diabetes, neurodegeneration and common health problems.

Statement of Benefit to California: Consider the tragic statistics that today the annual sale of diapers for urinary incontinence (UI) in women exceeds that of diapers for babies and that UI is the most common reason for families to institutionalize their elderly female relatives. The life expectancy of California women now exceeds 82 years. As we age, common age-associated tissue degeneration is a major physical, social, cultural and financial burden. Thus, UI is a major quality of life issue and public health concern both in terms of care and budgets. Overall, UI affects a staggering number of women resulting in annual health costs that exceed \$20 billion nationally, a cost comparable to that of arthritis and greater than that of breast cancer and all gynecological cancers combined. Currently surgery is the most common treatment for UI, with good short-term but poor long-term data. Repeat surgeries are more morbid and have decreased efficacy; current alternatives provide even less relief. We suggest that we can "do better" by the women of California through step-wise research that leverages: 1) Small clinical trials that have already been conducted, 2) ability to produce large numbers of relevant cell types for UI treatment, and 3) unique expertise of our team. Our research overcomes major limitations to provide a ready stem cell-derived target product that we anticipate will provide a safe and effective treatment of UI resulting in improved quality of life of a significant fraction of our population.

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